Rule WLM702: Log stream staging data set was full

Finding: The SMF Type 88 records showed that a log stream staging data set experienced a “staging data set full” condition.

Impact: This finding has a LOW IMPACT, MEDIUM IMPACT, or HIGH IMPACT on the performance of your computer system. The level of impact depends on the applications using the log stream, and the extent to which log stream delays effects the performance of these applications.

Logic flow: This is a basic finding, based on an analysis of the SMF Type 88 records.

Discussion: The system logger is an MVS component that allows an application to log data from a sysplex. The system logger component resides in its own address space on each system in a sysplex. Applications can log data from one system or from multiple systems across the sysplex.

Prior to OS/390 Release 2.4, the MVS system logger required a coupling facility (unless appropriate APARs were installed with OS/390 Release 1.3). With OS/390 Version Release 2.4 (or OS/390 Release 1.3 with appropriate APARs), individual log streams can use either DASD or a coupling facility.

- For a log stream that uses a coupling facility structure, a 'STRUCTURE FULL' condition can exist. In this case, the coupling facility has reached its capacity before off loading data to DASD[1]. This condition is analyzed by Rule WLM701.

- For a DASD-only log stream or for a log stream that is duplexed to a staging data set , a 'STAGING DATA SET FULL' condition can exist. In this case, the staging data set has reached its capacity before off loading data to secondary storage. This condition is analyzed by Rule WLM702.

If either of the above situations occur, they indicate that the logger cannot write data to secondary storage quickly enough to keep up with incoming data. Once the staging data set space for a log stream is filled, system logger rejects all write requests until the staging data set log data can be offloaded to DASD log data sets. Both situations can cause the application to wait before it can write more data. Depending on the length of time the

[1] This condition could be encountered during the rebuilding of a coupling facility structure, but rebuilding of a coupling facility structure is an event that would not require CPExpert’s analysis - such an event would be well-known to systems personnel!

application must wait, significant performance degradation would be experienced.

CPExpert compares the SMF88ETF (times a staging data set full was detected) variable in the MXG TYPE88 data set with the **LGDSFULL** guidance variable in USOURCE(WLMGUIDE). CPExpert produces Rule WLM702 when the SMF88ETF value exceeds the **LGDSFULL** guidance variable. The default value for the **LGDSFULL** guidance variable is zero, indicating that CPExpert should produce Rule WLM702 when any staging data set full condition was detected.

Suggestion: IBM suggests that you consider the following alternatives to reduce the staging data set full conditions:

- Increase the size of the staging data set.
- Reduce the HIGHOFFLOAD threshold percentage (the point at which the system logger begins off loading data from primary storage to off-load data sets).
- Review the size of the off-load data sets. These should be large enough to avoid too many "DASD shifts"--that is, new data set allocations. CPExpert normally will produce Rule WLM707 if too many DASD shifts occurred.
- Examine device I/O statistics for possible contention on the I/O subsystem used for off-load data sets.
- Use faster DASD devices.
- For CICS log streams, reduce the data written to the log stream by not merging so many journals or forward recovery logs onto the same stream.

Reference: OS/390 MVS: Setting up a Sysplex

OS/390 (V2R6):	Section 9.2.6, Section 9.4.5
OS/390 (V2R7):	Section 9.2.6, Section 9.4.5
OS/390 (V2R8):	Section 9.2.6, Section 9.4.5
OS/390 (V2R9):	Section 9.2.6, Section 9.4.5
OS/390 (V2R10):	Section 9.2.6, Section 9.4.5
z/OS (V1R1):	Section 9.2.6, Section 9.4.5
z/OS (V1R2):	Section 9.2.6, Section 9.4.5
z/OS (V1R3):	Section 9.2.6, Section 9.4.5
z/OS (V1R4):	Section 9.2.6, Section 9.4.5

